REMARKS

Response to Objections of Drawings

In response to the Examiner's objections to the drawings in the March 25, 2002 Office Action, the Applicants hereby request the Examiner to disregard the amendments of drawings previously made in the January 10, 2002 and the October 11, 2001 Responses.

New drawings labeled as Figures 9-11 are submitted herewith for the Examiner's review and approval. Figures 9 and 10 depict a hydrogen gas detector as claimed by claim 30 of the present application, either in absence of (Figure 9) or in the presence of hydrogen (Figure 10). Specifically, Figures 9 and 10 shows a thermal energy source that is separate from the light source, as recited by claim 30. Figure 11 depicts a hydrogen gas detector comprising a rare earth metal thin film deposited on an optical output surface of the light source, as recited by claim 36.

No new matter has been introduced by Figures 9-11, and Applicants therefore request the Examiner to approve, and upon approval to enter, such new Figures 9-11.

Response to Rejections of Claims 30-32 and 35-45

In the March 25, 2002 Office Action, the Examiner rejected claims 30-32 and 35-45, reiterating the reasons of rejection stated in the previously issued October 10, 2001 Office Action. Applicants therefore respond to each and every reason of rejection in the October 10, 2001 Office Action, as follows:

In the October 10, 2001 Office Action, the Examiner rejected claims 30-45 under 35 U.S.C. §112, first paragraph, for lack of enablement. Specifically, the Examiner stated that the specification

does not set forth how the light source and the thermal energy source are arranged so that to enable any person skilled in the art to make and use the same.

In response, Applicants have hereby amended claim 30, upon which the remaining claims 31-32 and 35-45 depend, to read: "**a thermal energy source that is separate from the light source**," as disclosed by the instant specification on page 16, lines 12-13 (stating that "the light source and the thermal energy source may comprise different elements").

The spatial arrangement of the light source and the thermal energy source is not critical for the practice of the present invention, as long as the optical filter is illuminated with light from the light source and is heated by the thermal source, **and can therefore be readily determined by one ordinarily skilled in the art**, without undue experimentation.

Therefore, pending claims 30-32 and 35-45 comply with the enablement requirements of 35 U.S.C. §112, first paragraph.

In the October 10, 2001 Office Action, the Examiner rejected claims 30, 33, and 34 under 35 U.S.C. §112, second paragraph, as being indefinite. Specifically, the Examiner stated that claim 30 discloses two sources, i.e., the light source and the thermal energy source, but claims 33 and 34 recite that the two sources are from the same element (claim 33) or different elements (claim 34).

In order to clarify the scope of the claims, Applicants have cancelled claims 33 and 34 in the Response filed on January 10, 2002, and Applicants have hereby amended claim 30 to clearly require that **the thermal energy source be "separate from the light source."**

The amendments of claim 30 and the previous cancellation of claims 33 and 34 therefore resolve any ambiguity regarding the relationship between the light source and the thermal energy source, and amended claim 30 thus overcome the Examiner's rejection.

In the October 10, 2001 Office Action, the Examiner rejected claims 30-45 as being unpatentable over Ito et al. U.S. Patent No. 4,661,320 (hereinafter "Ito") and/or Griessen et al., Journal of Alloys and Compounds, vol. 153-154 (1997) (hereinafter "Griessen").

In response, Applicants have amended claim 30, from which claims 31-32 and 35-45 depend, to require:

> "A hydrogen gas detector, comprising:
>
> a light source;
>
> **a thermal energy source that is separate from the light source**;
>
> an optical filter having an optical transmissivity responsive to the presence and concentration of hydrogen gas in an ambient environment to which the optical filter is exposed, said optical filter being disposed in proximity to the light source such that said optical filter is illuminated with light from the light source, and being operatively coupled to the thermal source such that **the optical filter is heated by the thermal source to an elevated temperature**;
>
> a light detector generating an output signal, the state of said output signal being proportional to the intensity of light impinging on the light detector, said light detector being disposed in light-sensing relationship to the optical filter, whereby light from the light source passing through the optical filter impinges on the light detector and generates said output signal as a indication of the presence and/or concentration of hydrogen gas in the ambient environment."

Ito discloses a light source (5). However, Ito does not teach or suggest in any manner a thermal energy source.

While failing to point to any teaching or suggestion in either Ito or Griessen about either provision of thermal energy to the hydrogen sensor or a thermal energy source, the Examiner cited Applicants' specification in support of the obviousness rejection, stating that because Applicants' specification teaches that a light source may perform both heating and lighting functions, the light source (5) disclosed by Ito covers both light and thermal energy sources as recited by claims 30-45.

It is well established that **obviousness cannot be read into the invention on the basis of applicant's own statements**. *In re Nomiya*, 184 USPQ 607 (CCPA 1975), citing *In re Murray and Peterson*, 122 USPQ 364 (CCPA 1959), and *In re Sporck*, 133 USPQ 360 (CCPA 1962). In other words, the Examiner, when determining the patentability of Applicants' claims to the invention, must view the prior art **without** reading into that art Applicants' own disclosure in the specification.

Moreover, descriptive matter that is not present in the description of a reference and would not be so recognized by persons of ordinary skill cannot be arbitrarily read into the reference by using extrinsic evidence. *Continental Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1981).

The Examiner in the present case has attempted to read into the teachings of Ito and Griessen a missing element, namely a thermal energy source, based on the contention that a light source always emits heat incidental to generation of light and is therefore also a thermal energy source.

Such contention is, however, incorrect, because **many light sources are "pure" light sources, which do not emit any thermal energy** incidental to generation of light. For example, an **LED**, as disclosed by Ito, may not generate any heat and therefore does not constitute a thermal energy source as required by claims 30-32 and 35-45. See the attached advertisements for the MicroStar® Super Bright-White LED Light (http://www.bosunsupplies.com/ProductMicroStar.cfm, visited on May 2, 2002), the Energy Wiser LED Desk and Table Lamps (http://www.theledlight.com/desklamps.html, visited on May 3, 2002), and the Ultra Bright White LED Light (http://www.thefiberopticstore.com/FOI-1000M.htm, visited on May 3, 2002). **Electroluminescent element** may also be used as a pure light source that is free of any heat generation. See the attached advertisement for the Tweakmonster® Electroluminescent Lightstrip (http://www.mod-this.net/web_html/blue/reviews_view.shtml?lstrip, visited on May 3, 2002). The **OmniGlow "Cyalume" lightsticks** also generate no heat during illumination. See the attached advertisement for the OmniGlow "Cyalume" lightsticks (http://www.painswessex.com.au/omniglow.htm, visited on May 3, 2002). Certain **fluorescent lighting sources** do not emit heat during light generation, either. See the attached article entitled "Fluorescent Lighting." Fiber optics only transmit light, and therefore constitute pure lighting sources, not thermal energy sources.

Therefore, the disclosure in Ito about a light source that is either LED or fiber optic, does not extrapolate to a thermal energy source, much less to a thermal energy source that is separate from the light source, as required by claims 30-32 and 35-45 of the instant application.

Claims 30-32 and 35-45 therefore are patentably distinguished over the teachings of Ito and Griessen.

Addition of New Claims 63-70

Applicants have added new claims 63-70 herein. The new claim 63, from which claims 64-70 depend, recites:

> "A hydrogen gas detector for detection of hydrogen gas in a gaseous environment, said detector comprising:
>
> **a light/heat source that emits both luminescent and thermal energy,**
>
> an optical detector, and
>
> an optical barrier therebetween,
>
> wherein the optical barrier is disposed in proximity to the light/heat source so that the optical barrier is simultaneously illuminated and heated by said light/heat source, wherein said light/heat source emits sufficient thermal energy to heat said optical barrier to an elevated temperature, wherein the optical barrier responds to the presence of hydrogen by responsively changing from a first optical state to a different second optical state, and whereby transmission of light from said light/heat source through said optical barrier is altered by the presence of hydrogen and said altered transmission is sensed by said optical detector to provide an indication of the presence of hydrogen gas in the gaseous environment."

In the September 5, 2001 Office Action, the Examiner stated that the light source (5) disclosed by Ito can also be considered as a "light/heat source" because any light source can have both function of heating and lighting.

Applicants strenuously disagree with the Examiner's reasoning and conclusion, on the basis that **many light sources are "pure" light sources, which do not emit thermal energy and do not constitute light/heat sources**, according to the foregoing discussion.

Specifically, Ito only discloses a light source comprising either an LED or fiber optic light source. Fiber optic light sources are definitely pure light sources that do not emit thermal energy. Many

LEDs do not generate heat, either. See the attached advertisements for the MicroStar® Super Bright-White LED Light (http://www.bosunsupplies.com/ ProductMicroStar.cfm, visited on May 2, 2002), the Energy Wiser LED Desk and Table Lamps (http://www.theledlight.com/desklamps.html, visited on May 3, 2002), and the Ultra Bright White LED Light (http://www.thefiberopticstore.com/FOI-1000M.htm, visited on May 3, 2002). Therefore, **Ito's disclosure of a light source comprising either an LED or fiber optic source alone does not provide a derivative basis for a light/heat source that emits both light and thermal energy**.

Moreover, Ito **expressly teaches away** from providing thermal energy or heating the hydrogen sensor.

Ito relates to a hydrogen gas sensor employing a solid compound that is reducible by hydrogen atoms, e.g., WO_3, MoO_3, TiO_2, $Ir(OH)_n$, V_2O_5, etc, whose photo-absorption rate changes when reduced by hydrogen. Nothing in Ito suggests addition of a thermal energy source to heat the hydrogen sensor. In fact, Ito considers temperature fluctuations as having undesirable impact on the performance of the hydrogen sensor and specifically teaches that even fluctuations in ambient temperature will deleteriously change the photo-absorption characteristics of the hydrogen sensor (see Ito, column 6, lines 51-56). Ito even provides a mechanism for compensating temperature fluctuations in the environment (see Ito, Figure 8, and column 6, lines 48-65).

It is obvious that Ito strives to minimize the impact of temperature fluctuations on the hydrogen sensor. Direct heating of the hydrogen sensor to increase temperature fluctuations is therefore inconsistent with the express teachings of Ito. **A person ordinarily skilled in the art, after reading It , would n t contemplate replacing the LED or fiber optic light source disclosed by It with a light source that will also emit heat and cause temperatur fluctuations in the**

hydr gen sensor. Contrariwise, such person would retain the pure light sources (i.e., LED or fiber optics) disclosed by Ito, which do not generate heat and can therefore satisfactorily reduce or eliminate temperature fluctuations.

The approach of applicants' claimed invention, i.e., the use of a light/heat source that emits both light and thermal energy, directly flies in the face of Ito's teachings and would be consciously avoided by a person ordinarily skilled in the art.

Griessen does not teach or suggest provision of a light/heat source and cannot cure the deficiency of Ito.

Therefore, neither Ito nor Griessen nor their combination provides a derivative basis for a light/heat source that emits both light and thermal energy, as required by claims 63-70 of the instant application.

CONCLUSION

In view of all the foregoing, claims 30-32, 35-45, and 63-70 as amended/added herein are in form and condition for allowance. Issue of a Notice of Allowance therefore is respectfully requested.

No fee is due for the entry of this Amendment, in light of the previous cancellation of claims. Nevertheless, if any fee or charge is deemed properly payable, the United States Patent and Trademark Office hereby is authorized to charge any payment necessary to the entry of this Amendment, to Deposit Account No. 08-3284 of Intellectual Property/Technology Law.

If any issues remain outstanding, the Examiner is requested to contact the undersigned at (919) 419-9350 to discuss their resolution, and expedite closure of prosecution on the merits in favor of allowance of claims 30-32, 35-45, and 63-70.

Respectfully submitted,

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(919) 419-9354
Attorney File: 2771-401 (ATMI 7484)

APPENDIX A

Version with Markings to Show Changes Made

In the Specification:

1. Previously made amendments of drawings in the January 10, 2002 and the October 11, 2001 Responses are hereby disregarded, and new Figures 9-11 have been hereby added to the specification.

2. On page ~~7~~ 6, the paragraph beginning at line ~~4~~ 12 has been changed, as follows:

Fig. [1A] 1 is a schematic representation of one embodiment of the present invention [according to one embodiment], in the absence of hydrogen gas. [Fig. 1B is 1 is a schematic representation of the present invention according to a second embodiment, in the absence of hydrogen gas.]

3. On page ~~8~~ 7, the following new paragraphs have been added after the first paragraph. line 9

Fig. 9 is a schematic representation of a third embodiment of the present invention, in the absence of hydrogen gas.

Fig. 10 is a schematic representation of the third embodiment of the present invention, in the presence of hydrogen gas.

Fig. 11 is a schematic representation of a fourth embodiment of the present invention, in the absence of hydrogen gas.

4. On page 21, the paragraph beginning on line 1 has been changed, as follows:

Referring to [Figs. 1A and 1B] Fig. 1, light bulb 10 comprising incandescent filament 16 has deposited thereon a rare earth metal thin film layer 12, preferably comprising a trivalent rare earth metal, such as yttrium, that is reversibly reactive with hydrogen to form both metal dihydride and metal trihydride reaction products. Over the rare earth metal thin film layer 12 is deposited a protective layer 14, comprising a suitable material, such as for example Pd, Pt, Ir, Ag, Au, Ni, Co, or alloys thereof, and most preferably comprising palladium. In the absence of hydrogen in the

ambient environment to which the bulb is exposed, the rare earth metal thin film 12 is in a metallic, optically reflective dihydride state. Light from filament 16 is attenuated by the dihydride state of rare earth metal thin film layer 12 and thus only a portion of it reaches photo-detector 18.

5. On page 22, the paragraph beginning on line 4 has been changed, as follows:

In Figure [1A] 1, filament 16 of coated light bulb 10 is additionally a heat source, elevating the temperature of rare earth thin film 12. [In Figure 1B, heat-generating element 17 is depicted as a resistive element. However, heat-generating element 17 may comprise incandescent bulbs, resistive wires, exothermic chemical reactions, ultrasonic radiation, acoustic radiation, microwave radiation, laser radiation or other such heat-generating elements as known to those skilled in the art.] The transition of rare earth thin film 12 from reflective dihydride to transparent trihydride state and back, in response to the absence or presence, respectively, of hydrogen occurs much more rapidly at elevated temperatures. This reduces both the response time of the detector in the presence of hydrogen and its recovery to the opaque "null state" in the absence of hydrogen.

6. On page 25, the following paragraphs have been added before the paragraph beginning at line 16:

Figures 9 and 10 depict another embodiment of the present invention, wherein the light source and the thermal energy source are separate elements. Figure 9 shows a hydrogen gas detector 30 in the absence of hydrogen, which comprises a light source 32, a thermal energy source 34 that is separate from the light source 32, an optical filter 36, and a light detector 38, and Figure 10 shows such hydrogen gas detector 30 in the presence of hydrogen. The optical filter 36 is placed in proximity to the light source 32, so that the optical filter 36 is illuminated with light from the light source 32. Additionally, the optical filter 36 is operatively coupled to the thermal energy source 34, so that the optical filter 36 is heated by the thermal energy source 34 to an elevated temperature, at which the hydrogen gas sensor 30 responses to the presence of hydrogen and recovers in the absence of hydrogen much more rapidly. The light source 32 can be any light-generating device, such as incandescent bulbs, light emitting diodes, fluorescence lamps, electroluminescent lamps, optical lasers, and optical waveguides illuminated by any such light-generating element. The thermal energy source 34 can be any heat-generating element that is separated from the light sourc , such as resistive wires, exothermic chemical reactions, ultrasonic

radiation, acoustic radiation, microwave radiation, and laser radiation. The optical filter 36 may comprise a rare earth metal thin film that is overlaid by a protective layer 37, which may in turn comprise a hydrogen-permeable material, such as Mg, Ca, Al, Ir, Ni, or Co, or a metal selected from the group consisting of palladium, platinum, and iridium. The spatial arrangement of the light source 32, the thermal energy source 34, and the optical filter 36 is only exemplary in Figures 9 and 10, and shall not be construed to limit the broad scope of the present invention.

Figure 11 depicts another embodiment of the present invention, where the optical filter comprises a rare earth metal thin film deposited on an optical output surface of the light source. In Figure 11, the hydrogen gas detector 50 comprises a light source 32 having an optical output surface 53. A rare earth metal thin film 56, which functions as the optical filter, is deposited on the output surface 53 of the light source 32. Said rare earth metal thin film 56 may comprise a rare earth metal selected from the group consisting of trivalent rare earth metals that are reactive with hydrogen to form both metal dihydride and metal trihydride reaction products, and such metal dihydride and metal trihydride reaction products have differing optical transmissivity. The rare earth metal thin film 56 is heated to an elevated temperature by a thermal energy source 54 that is separate from the light source 52. The rare earth metal thin film 56 is also overlaid by a protective layer 57, which may comprise a hydrogen-permeable material, such as Mg, Ca, Al, Ir, Ni, and Co, or a metal selected from the group consisting of palladium, platinum, and iridium.

In the Claims:

30. (Amended) A hydrogen gas detector, comprising:

a light source;

a thermal energy source that is separate from the light source;

an optical filter having an optical transmissivity responsive to the presence and concentration of hydrogen gas in an ambient environment to which the optical filter is exposed, said optical filter being disposed in proximity to the light source such that said optical filter is illuminated with light from the light source, and being operatively coupled to the thermal source such that the optical filter is heated by the thermal source to an elevated temperature;

a light detector generating an output signal, the state of said output signal being proportional to the intensity of light impinging on the light detector, said light detector being disposed in light-sensing relationship to the optical filter, whereby light from the

light source passing through the optical filter impinges on the light detector and generates said output signal as a indication of the presence and/or concentration of hydrogen gas in the ambient environment.

32. (Amended) The hydrogen gas detector of claim 30, wherein the thermal energy source comprises a heat-generating element that is separate from the light source selected from the group consisting of [incandescent bulbs,] resistive wires, exothermic chemical reactions, ultrasonic radiation, acoustic radiation, microwave radiation, and laser radiation.

63. (New).

64. (New).

65. (New).

66. (New).

67. (New).

68. (New).

69. (New).

70. (New).

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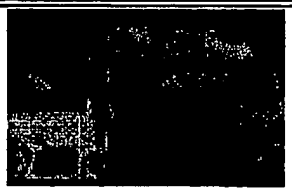
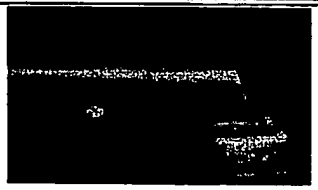
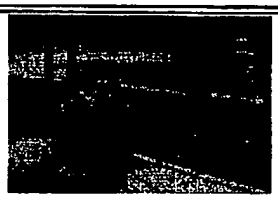
 Interior & Cabin Lighting	 In Stanchions & Hand Rails
 Underwater	 Decks and Railings
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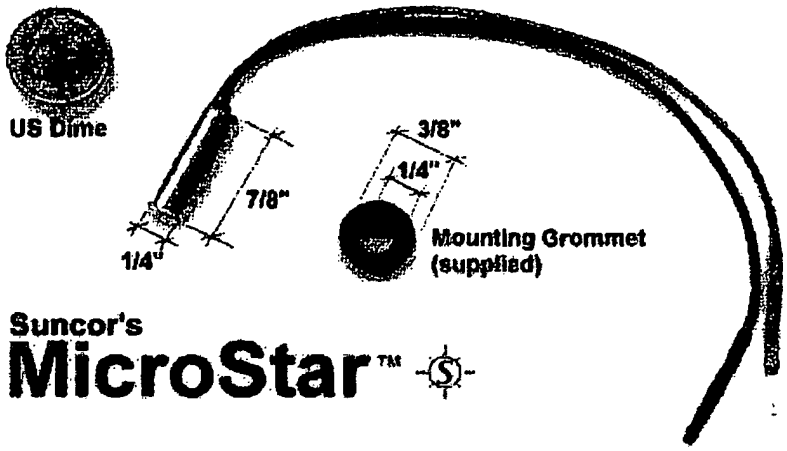

Mounting Options:

For flush mount, drill 1/4" hole & use grommet as locking nut to secure fitting.
For thick or solid wall installation, mount using silicone in hole.

For thin panel or tubing, drill 3/8" hole & use grommet to hold unit in place and seal hole.

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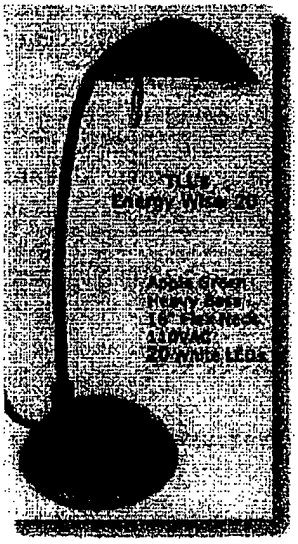

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All of the electrical connections have been reinforced to insure a quality product.

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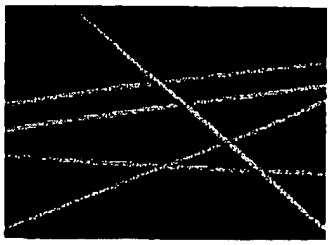
(WLH: 7mm x 9mm x 10mm Switch is SPST)

Tweakmonster Lightstrip review

Written by: CileGray

Date: October 25, 2001
Manufacturer: Tweakmonster
Supplier: Tweakmonster
Suggested Retail Price: $75 CDN ($49.95 USD)

Today, with the growing market of case-modders, manufacturers are starting to produce mod-intented products, may it be cooling kits, windows, etc. This means that users hhave more possibilities, more choices, and this is also true when it comes to case-lighting. Companies have been making neons for ages, but some pre-wired neons are coming onto the market, along with the cold cathodes, smaller lamps and el cable. With all those new possibilities, the case-modder has a whole new sets of doors opening up to him. On of those new innovation that opens many doors is this new product from Tweakmonster, which I would like to thank for the sample and quick replies.

(Images courtesy www.tweakmonster.com)

The lightstrip is, as the name implies, a thin strip, about 0.020 inch think, which holds two parallel channels of electroluminescent particles. The unit is powered by a small power converter contained within a black plastic box, which is easily concealable just about anywhere in one's case....

Before we get into further details about the product, here are some of the specifications, taken directly from the TweakMonster website (many of which are unique to the Lightstrip) :

- 7/16 of an inch wide x .020 (20 thousandths of an inch) thick
- self-adhesive backing sticks to anything stickable
- fully bendable and configurable
- may be cut to different lengths, all of which will glow individually
- comes in any color of the spectrum you can think of
- uses small power converter that is easily hidden, and can run numerous Lightstrips at once
- negligible power consumption
- NO heat generated from the light (which is always good)
- fully weatherproof
- can conform to just about any type of surface, including sharp bends and corners
- burn life of 15,000 hours (3 years straight)
- works right off your computer's power supply
- can handle heat just fine (like heatsink installations.....)

Next page : More details, testing, and pictures.

A Great Emergency Light Source

Back

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OmniGlow provide a light source MORE DEPENDABLE than flashlights.

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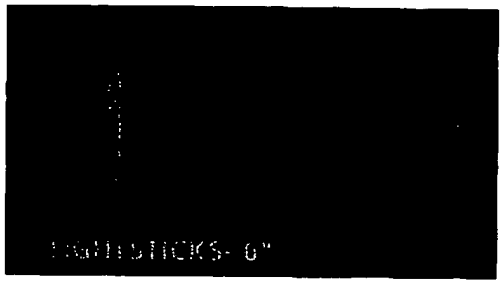
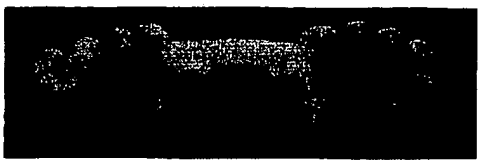
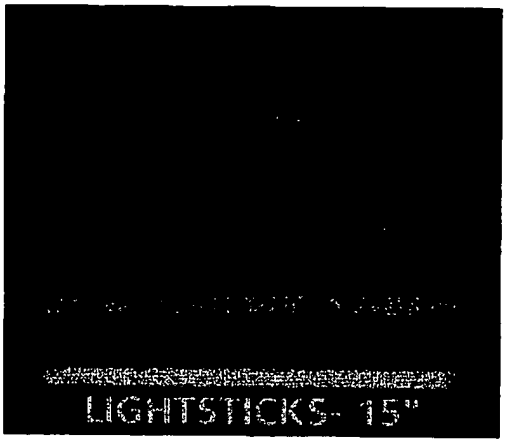
- Non-explosive
- Hands-free capabilities
- Waterproof and Buoyant
- Not effected by wind or weather
- No special shipping or disposal requirements
- 360 degree light generation.





Simply Bend, Snap and shake.



FLUORESCENT LIGHTING

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Just over 10 years ago, BALCAR was the first to introduce a professional fluorescent light for TV studio lighting based on the highly popular mirror reflector system. The BALCAR FLUXLITE soon became the standard in the industry worldwide, and copied by all.

The last few years have shown increased acceptance of fluorescent lighting for professional applications in news rooms, movie and video production studios and virtual studios. There is no doubt that the latest fluorescent technology combining high frequency silent ballasts with high color rendition bulbs, produces a high quality light with significant cost savings. BALCAR adds another dimension: improved light quality.

Often fluorescent lighting is used in «soft light» applications, to create a general level of lighting with added low power tungsten spots to create highlights. Most applications use lights at distances less than 4 m.

While most manufacturers are glutting the market producing low efficiency fixtures, BALCAR is developing more powerful and more concentrated lights, breaking the 4 m barrier into larger and larger studios.

In 1998, BALCAR launched two lines of new products, SPOTFLUX and POWERFLUX, and has since added more models. They correspond entirely to our philosophy: creating more directional and powerful lights.

The best way to describe the SPOTFLUX is to compare it to a large Fresnel spot with a light level of diffusion: lighting is directional, real shadows with soft edges are created. The SPOTFLUX 1, 2 and 4 can also be focused and dimmed, without change in color temperature. No heat is generated.

For large studios, the POWERFLUX 1 and 2 give a concentrated light. BALCAR has always stressed the need for high efficiency and more directional lights, so the lighting is more controlled, with lights placed further.

This «directional fluorescence» concept is also present in BALCAR's «ENG» lighting systems (A/C ZOOMLITE and battery CAMFLUX), with unique features like interchangeable reflectors and focus control. Using those lights is a «win-win» situation, with less energy consumption (longer battery life), improved light quality and no heat generated.

In 2001, BALCAR launched a new generation of the DUOLITE, QUADLITE and FLUXLITE line, with a new arrival, the OCTALITE, using the highly efficient 55 W lamps. We took particular care to their impeccable design, combining solidity with a distinguished architectural look, as more and more fixtures are visible in open-space studios.

The introduction of the DUOSTRIP and QUADSTRIP, two lightweight, easy to mount strip lights, added to the existing TWINLITE system, offers new possibilities for smaller studios, special effects and location work.

A good fluorescent system for high quality broadcast lighting has the following features:

- **High-Frequency Flicker-free Lighting:**
  This is critical because any change in light output during scanning of the CCD camera will appear as defective lines. Balcar electronic ballasts operate at 56 kHz and are usable on any camera.

- **Consistent Light Output:**
  It is important that the light output remain constant over time, particularly as the unit heats up, so that the quality of the broadcast remains constant. Typically, this consistency is obtained for at least the first 9,000 hours of operation of a new lamp, though a lamp can last over 15,000 hours.

- **Consistent Color Output:**
  As with light output, it is critical that color temperature remain constant over extended periods of time, particularly as the unit heats up.

- **High Color Rendition:**
  Also known as «full spectrum» so that every color appears as true as the original.

- **Compatible with Tungsten:**
  The spectrum of the Tungsten balanced bulbs must be compatible with standard Tungsten lights to allow for a mix in certain situations.

- **Dimming Capabilities:**
  The ability to adjust power output over a wide range - without change in color temperature - allows you to illuminate a wide variety of subjects at different distances and to control depth of field. Balcar units offer dimmable power up to 4 or 5 f-stops, phase dimming, 0/+10 V or DMX.

- **Light-Control Capabilities:**
  Balcar offers a range of different light sources for different effects, with a wide variety of light control accessories. All types of lighting, from soft, low-contrast to direct high-contrast are possible with Balcar fluorescence.

Fluorescence remains the best solution for most studios

Fluorescence has proven to be over the years both economical and practical:

- **Energy Saver:**
  Balcar has equipped more than 1,000 studios world wide, with the same conclusion time after time: Balcar fluorescent solutions will cut energy consumption by an average of 90%. Therefore, a good estimate for the energy consumption of a Balcar fluorescent solution for your studio is to divide by 10 a typical Tungsten consumption.

- **Heat Saver:**
  The power that goes into light does not go into heat, so you save again on air-conditioning costs while making it more pleasant for all in the studio.

- **The Only Solution for Low-Ceiling Studios or Low-Powered Studios:**
  Because more and more studios are set-up in regular buildings, they are not equipped (or would be too expensive to equip) to accept full Tungsten set-ups. Fluorescence is therefore the answer.

- **DMX Dimming for «Soft» and «Spot» Lights:**
  All Balcar fixtures, soft and spot are fluorescent and can be dimmed via DMX. Dimming is therefore simple and low-cost, as dimmer racks are unnecessary: you go straight from the DMX console to the fixtures, with simplified A/C wiring.

- **Genuine Cost Saver:**
  Taking into account all of the above, as well as the incredible life (and low cost) of the bulbs (ca. 10,000 hours), fluorescence is no doubt a great value investment, often paid for through savings before the lights are even turned on.